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TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Protecting Texas by Reducing and Preventing Pollution

June 22, 2012

Ms. Cyndi Benson
Harmsco Filtration Products
P.O. Box 14066
North Palm Beach, Florida 33408

Subject: Challenge Study Review
Notification of Discrepancy
Harmsco® Model HC/170 Cartridge Filter

Dear Ms. Benson:

On May 18, 2012, the Texas Commission on Environmental Quality (TCEQ) received an email from Ms. Susan Harting, Cadon Marketing, Inc., stating that TCEQ's April 25, 2012 letter contained a discrepancy in our description of the reviewed Harmsco's® Model HC/170 – LT2 cartridge filter's dimensions. Specifically, Ms. Harting noted that our April 25, 2012 letter reported a diameter of four (4) inches and did not specify if this was an inner or outer diameter for the Harmsco® Model HC/170 – LT2 cartridge filter. Ms. Harting stated that the Harmsco's® Model HC/170 – LT2 cartridge filter has an inner diameter of four (4) inches with an outer diameter of seven and three-quarters (7.75) inches. We agree with Ms. Harting's assessment that this TCEQ discrepancy needs to be corrected. Since any modifications to the Harmsco's® Model HC/170 – LT2 cartridge filter in the future could require a new challenge test of the modified cartridge filter, it is important that the TCEQ's description be accurate. Therefore, **this letter replaces our April 25, 2012 letter.**

On August 31, 2011, the TCEQ received submitted challenge study data to support Harmsco's® Model HC/170 – LT2 cartridge filters' removal credit for *Cryptosporidium* oocysts and *Giardia lamblia* cysts when installed in an individual filter cartridge configuration. Additional data was received from IBR Laboratories on February 15 and 27, and March 7, 2012. Two individual cartridge filters were challenge tested using 2.0-micron latex spheres as a surrogate for *Cryptosporidium* oocysts. A suitable surrogate for challenge testing was discretely quantifiable and not be removed more efficiently than *Cryptosporidium* oocysts. In accordance with Title 40 of the Code of Federal Regulations §141.719, the State can grant up to 2.0-log removal credit for *Cryptosporidium* oocysts for individually challenge tested filters. This regulation also requires a minimum factor of safety of 1.0-log to be applied to individually challenge tested filters for *Cryptosporidium* oocysts removal credits.

This data was submitted in accordance with Title 30 of the Administrative Code (30 TAC) §290.42(g)(2). Based on federal and state requirements, we are **approving the following removal credits**:

TCEQ Cartridge Specific Granted Removal Credits			
Bin & Configuration	Crypto	Giardia	Viruses
Bin 1 Individual	2.0-log	3.0-log	0.0
Bin1 Series	2.0-log	3.0-log	0.0
Bin 2, 3, 4 Individual	2.0-log	3.1	0.0
Bin 2, 3, 4 Series	2.0-log	3.1-log each cartridge filter, But no more than 6.7-log for two in series	0.0

The above removal credits for *Cryptosporidium* oocysts and *Giardia lamblia* cysts were based on:

1. For public water systems assigned Bin 1 classification due to the occurrence of *Cryptosporidium* oocysts in their raw water sources, the minimum required removal for *Cryptosporidium* oocysts is 2.0-log and 3.0-log inactivation and/or removal for *Giardia lamblia* cysts. The Harmsco® Model HC 170 – LT2 cartridge filter demonstrated 3.6-log removal of the 2.0-micron surrogate and the use of a safety factor would result in a removal credit greater than what is required.
2. For public water systems assigned Bin 2, 3, or 4 classifications due to the occurrence of *Cryptosporidium* oocysts in their raw water sources and proposing to use the Harmsco® Model HC 170 – LT2 cartridge filter, only the allowed removal credit was granted because:
 - a. Although a greater inactivation and/or removal treatment than 2.0-log is required for *Cryptosporidium* oocysts, 40 Code of Federal Regulations (CFR) §141.719(a) only allows up to 2.0-log removal credit to be granted for individually tested cartridge filters; and
 - b. The Harmsco® Model HC 170 – LT2 cartridge filter was not challenge tested in series and cannot receive up to 2.5-log removal credit allowed by 40 CFR §141.719(a) for cartridge filters challenged in series.
3. Please note that the federal rules do not address the inactivation and/or removal for *Giardia lamblia* cysts at public water systems assigned Bin 1, 2, 3, or 4 classifications due to the occurrence of *Cryptosporidium* oocysts in their raw water sources. However, when cartridge filters are used for the removal of *Giardia lamblia* cysts, the TCEQ has chosen to apply a safety factor of 0.5-log to:
 - a. The demonstrated challenge test removal for a single cartridge filter installed individually;
 - b. The sum of two or more individually challenged cartridge filters installed in series; and

- c. The demonstrated log removal credit for series challenged cartridge filters.

The above TCEQ approved removal credits are valid only:

1. For the submitted Harmsco® Model HC 170 – LT2 cartridge filter model and not for any other Harmsco cartridge filter models or variations of this model.
2. For the Harmsco® Model HC 170 – LT2 cartridge filters without any modifications to the design and construction as challenged.
3. If the Harmsco® Model HC/170 – LT2 cartridge filters are operated:
 - a. At a pressure drop no greater than 30 pounds per square-inch (psi);
 - b. At a flow rate no greater than 100 gallons per minute (gpm); and
 - c. In a Harmsco® Hurricane® Model HUR 1X170FL, 3X170FL, 5X170FL, or 8X170FL housings (pressure vessel).
4. All cartridge filters and o-rings must be intact and the integrity cannot be compromised to receive the granted removal credit.
5. For the current Federal and State statutes and rules.

The submittal included the following information:

- Single-pass challenge studies were conducted on two Model HC/170 – LT2 cartridge filters, Serial No. 11691-3 and 11691-4;
- 2.0-micron latex spheres were used as the challenge media;
- Challenge test results (after initial flushing and adjustment of the sample ports to provide consistent results):
 - Cartridge filter Serial No. 11691-3 achieved the following log removal of the 2.0-micron spheres:
 - 3.57-log at startup (8.0 psi pressure drop);
 - 3.82-log at 50% of the terminal pressure drop (15 psi pressure drop); and
 - 3.84-log removal at terminal pressure drop (30 psi pressure drop).
 - Cartridge filter Serial No. 11691-4 achieved the following log removal of the 2.0-micron spheres:
 - 3.85-log at startup (7.0 psi pressure drop);
 - 3.68-log at 50% of the terminal pressure drop (15 psi pressure drop); and
 - 3.67-log removal at terminal pressure drop (32 psi pressure drop).
- A Harmsco® Hurricane® Swing Bolt Model HUR 1X170FL housing was used during the challenge study;
- The Model HC/170 – LT2 cartridge filters are constructed of pleated microglass design;

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- Each Model HC/170 – LT2 cartridge filter was:
 - 30.75 inches in length;
 - 4.0 inches inner diameter;
 - 7.75 inches outer diameter; and
 - A surface area of 120 square-feet.
- Harmsco® Hurricane® Swing Bolt Model HUR housing models and Model HC/170 – LT2 cartridge filters conform to American National Standards Institute/National Sanitation Foundation (ANSI/NSF) Standard 61 and have been certified by a testing organization accredited by ANSI.

Please provide a copy of this letter to each of your Texas customers and their consulting engineers. This letter is not to be construed as:

- A TCEQ-granted exception for a public water system to use the challenge tested cartridge filters discussed in this letter;
- TCEQ approval for a public water system to install the referenced cartridge filters; or
- TCEQ approval for a public water system's required concentration × time (CT) study.

Each public water system must request and receive **site-specific approval** to use cartridge filtration in accordance with 30 TAC §290.42(g) and §290.39(l).

If you have questions or need further assistance, please contact James "Red" Weddell, P.E. of my staff by telephone at (325) 481-8056 or by email at james.weddell@tceq.texas.gov or by correspondence at the following address:

Technical Review & Oversight Team - MC 159
Texas Commission on Environmental Quality
P.O. Box 13087
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Sincerely,



Ada Lichaa, P.G., Manager
Plan & Technical Review Section
Water Supply Division
Texas Commission on Environmental Quality

AL/JSW/

cc: Ms. Cindy Haynie, TCEQ Technical Review & Oversight Team – MC 159
Mr. Don Myers, Cadon Marketing, Inc., 2437 Bay Area Blvd. #412, Houston, TX 77058-1519
Ms. Vera Poe, P.E., Team Leader, Utilities Technical Review Team – MC 159